CLAIMS:

The claimed inventions are:

1. A process for preparing roughened copper surfaces suitable for subsequent multilayer lamination, said process comprising the steps of: contacting with a clean copper surface an adhesion promoting composition under conditions effective to provide a roughened copper surface, said adhesion promoting composition consisting essentially of hydrogen peroxide, a pH adjuster, a topography modifier, and a uniformity enhancer, and at least essentially free of halogen ions.

2. The process according to claim 1, wherein said process is preceded with the optional step of providing a substantially clean copper surface.

3. The process according to claim 1, wherein said process further comprises the step of contacting the uniform roughened copper surface with a post-dip.

4. The process according to claim 3, wherein said post-dip comprises an azole or silane compound or a combination of said azole and said silane.

5. The process according to claim 4, wherein said post-dip further comprises a titanate, zirconate, aluminate or a combination of said titanate, zirconate and aluminate.

6. The process of claim 4, wherein said silane is selected from the group consisting essentially of

3-methylacryloyloxypropyltrimethoxysilane,

3-(N-styrylmethyl-2aminoethylamino) propyltrimethoxysilane hydrochloride,

3-(N-allyl-2-aminoethylamino)-propyltrimethoxysilane hydrochloride,

N-(styrylmethyl)-3-aminopropyltrimethoxysilane hydrochloride,

N-2-aminoethyl-3-aminopropyltrimethoxysilane,

3-(N-Benzyl-2-aminoethylamino)-propyltrimethoxy silane hydrochloride,

beta-(3,4-epoxycyclohexyl) ethyltrimethoxysilane,

gamma-aminopropyl-triethoxy silane,

gamma-glycidoxypropyltrimethoxysilane, and

vinyltrimethoxysilane.

7. The process of claim 5, wherein said titanate is selected from the group comprising titanate amine, tetraocytl di(ditridecyl)phosphito titanate, tetra(2,2-diallyloxymethyl) butyl-di(ditridecyl)phosphito titanate, and neopentyl(diallyl)oxy-

tri(dioctyl)pyrophosphatotitanate, and neopentyl(diallyl)oxytri-(m-amino)phenyl titanate.

8. The process of claim 5, wherein said zirconate is selected from the group comprising tetra (2,2 diallyloxymethyl)butyl, di(ditridecyl)phosphito zirconate, neopentyl(diallyl)oxy, trineodecanoyl zirconate, neopentyl(diallyl)oxy, tri(dodecyl)benzene-sulfonyl zirconate, tetra (2,2 diallyloxymethyl)butyl-di(ditridecyl)phosphito zirconate, and zirconium IV 2,2-dimethyl 1,3-propanediolo.

9. The process of claim 5, wherein said aluminate is selected from the group comprising diisobutyl(oleyl)acetoacetylaluminate, and diisopropyl(oleyl)acetoacetyl aluminate.

10. The process according to claim 1, wherein said uniformity enhancer is 5-aminotetrazole.

11. The process according to claim 1, wherein said adhesion promoting composition further consists essentially of a copper salt.

12. The process according to claim 1, wherein the process further comprises the step of draining excess cleaning solution from the copper surface.

13. A process for preparing roughened copper surfaces suitable for subsequent multilayer lamination, said process comprising the steps of: (a) applying a highly built alkaline cleaning solution to a copper surface to provide a substantially clean copper surface; and (b) dipping the clean copper surface into an adhesion promoting composition to provide a uniform roughened copper surface suitable for subsequent multilayer lamination, said adhesion promoting composition consisting essentially of an oxidizer, a pH adjuster, a topography modifier, and at least one of a uniformity enhancer and a coating promoter.

14. The process according to claim 13, said adhesion promoting composition including a coating promoter.

15. A process for increasing the adhesion of a dielectric material to a metal surface, wherein the metal surface comprises copper or copper alloys, said process comprising:

(a) contacting the metal surface with an adhesion promoting composition comprising an adhesion-promoting effective amount of:

(1) an oxidizer;

(2) an acid;

(3) a topography modifier; and

(4) a coating promoter;

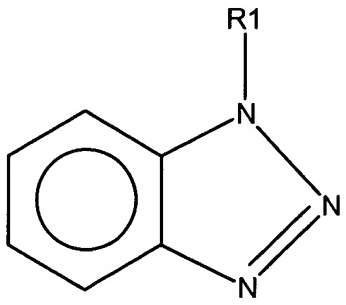
(b) bonding the dielectric material to the metal surface.

16. A process according to claim 15 wherein the adhesion promoting composition further comprises a uniformity enhancer.

17. A process according to claim 15 wherein the topography modifier is a 5-membered aromatic fused N heterocyclic compound, wherein the N heterocyclic ring has a nitrogen atom at position 1 bonded to a hydrogen atom.

18. A process according to claim 15 wherein the coating promoter is a 5-membered aromatic fused N-heterocyclic compound with 1 to 3 nitrogen atoms in the fused ring, wherein none of said nitrogen atoms are bonded to a hydrogen atom.

19. A process according to claim 15 wherein the coating promoter has the following structure:



wherein **R1** is selected from the group consisting of hydroxyl groups, amino groups, alkyl groups, hydroxyalkyl groups,

aminoalkyl groups, nitroalkyl groups, mercaptoalkyl groups, and alkoxy groups.

20. A process according to claim 15 wherein the coating promoter is 1-hydroxybeznotriazole.